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Implementing Rapid Prototyping Model in Logistics Operations Manual Creation

Valmet Transportation Case

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Abstract

This thesis is a qualitative project-based study about creating Logistics Operations Manual for Valmet Transportation staff. The thesis is roughly divided in two parts: supporting theory and data analysis, and Logistics Operations Manual. The client of the thesis is Valmet Technologies, Inc., a leading global developer and supplier of services and technologies for process industries.

Theory was gathered from books and article databases and used to support the instructional design theory and rapid prototyping process. The theoretical framework consisted of human resource management, change management, internal communication, logistics and supply chain management education, and instructional design.

The Logistics Operations Manual was created using instructional design theory's rapid prototyping model.

Keywords/tags (subjects)
Logistics Operations, Manual, Instructional Design, Rapid Prototyping, Human Resources Management, Internal Communication, Change Management, Education

Miscellaneous
Appendix 5 is in PDF format and 48 pages. Appendices 3, 4 and 5 are not included in the online publication.

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Abbreviations

HRM	Human Resources Management
ID	Instructional Design
IT	Information Technology
KPI	Key Performance Index
OJT	On-the-job Training
SOP	Standard Operating Procedure
VaTT	Valmet Transportation Team
WTO	Way To Operate

1 Introduction

This thesis is an empirical project-based study of logistics operations manual's instructional design for Valmet Technologies, Inc. The study is based on Valmet Transportation Team's (VaTT) request to create a logistics operations manual for operational staff through empirical and qualitative research. Quantitative data was collected from employee survey, which was then summarised and analysed using descriptive statistics.

The aim of this study is to create a manual using rapid prototyping for Valmet Transportation employees, which will assist them in their working tasks. The content of the essential manual was agreed in the beginning of the study.

The Introduction chapter of the thesis presents the background and objectives of the thesis and project, presents the used methodology, describes research limitations, draws the theoretical framework of the study and research structure, and introduces the client of the thesis.

The greater cause of this project-based study is to reflect the instructions design process in the field of logistics and which topics are studied and considered to conduct it for a corporation which is currently in a post-demerger phase.

1.1 Background of the project

Logistics has a significant role in Valmet's daily business as transportation activities consist of transportation by land, sea and air as transportation spend exceeded € 100 million. VaTT (2015) has noted, that often the shortage of knowledge in the transportation mode decision making has caused avoidable extra costs.

Valmet Corporation is a big multi-national enterprise which is hiring new personnel globally on a daily basis. According to Kurkinen (2015), VaTT does not have the capability to monitor each change in operational staff and participate in their training. In addition, to date, each Valmet's site is responsible for the induction of a new employee and is mainly limited to site specific introduction.

Hence the standard level of logistics knowledge is believed to vary from site to site. (Kurkinen & Valmet Transportation Team 2015)

Kurkinen states in Loikkanen's e-mail (2015), that in Valmet there are currently no standardized prepared instructional material for new employees from the top management level, which could harmonize the level of logistics knowledge and reduce mistakes and costs in the logistics chain. Therefore, VaTT has requested to produce a manual for operational staff for transportation purposes.

Valmet Corporation demerged from Metso Group in December 2013 and Transportation category was established as part of Valmet functions in January 2014. Since then the corporate is still found to be in a post-demerger phase. Interviews with Ms. Väisänen, Ms. Moilanen and Ms. Laitiainen (2015) presented current shortcomings in information handling as some sources still contain Metso's content. Therefore all the necessary content has to be controlled and updated.

1.2 Objectives and scope of the study

The main aim of this multi-disciplinary project-based study is to produce a logistics operations manual for Valmet Transportation for its global operations. The data about the need of a handbook is collected by qualitative interviews with VaTT and business unit managers, and general survey for Valmet Transportation employees.

The product of the study, essential logistics operations manual, gives and answer to following operational staff question: How to choose a correct transportation mode?

The scope of the study is to create an unambiguous manual which will help operational staff and low level managers to solve every day logistics and transportation related issues, increase employees on field knowledge and use it to innovate and implement new working methods which will save costs and optimise operations.

According to van Rooij (2010), a project is successful when it is delivered on time, with budget and meets client's expectations. Additionally, a project is said to be small when its duration is less than 6 months, has a small team with small number of skill areas, has a straightforward outcome and has a budget of $ 75,000. Therefore current project can be classified as small project as its duration is from February 2015 till May 2015, has one writer and is required to produce an essential manual meeting VaTT's expectations and Valmet Transportation employees' needs.

1.3 Methods

The project has been approached as a development project offering intrinsic value to Valmet Corporation and therefore differs from ordinary academic papers. Theoretical research was conducted to create theoretical support to the work, whilst qualitative research was done using empirical approach and formative evaluation supported by meetings, questionnaires, survey and interviews was used to gather necessary information. Quantitative data was collected from employees' survey, which was then analysed using descriptive statistics.

The manual was compiled using empirical methodology. More precisely, rapid prototyping was used to utilise the manual among employees and make changes to the content according to their feedback.

1.4 Research Limitations

The biggest limitation of this study was time. It was required to work efficiently and compile a manual in short period of time while maintaining the good quality of the outcome. The manual is limited to help employees in global logistics related questions and does not deal with ordinary or expected employee orientation.

Theory was chosen according to the pertinence of Valmet Corporation's current situation and need, so that it would support instructional design theory and its implementation in practice. Therefore, the study in supportive theories

have been done to necessary extent. The selection of theory is relevant to this project and might not be generalizable for other cases.

Quantitative data collection in the form of a survey had a time, population and answering limit. The survey for employees was conducted in Survey-monkey.com platform in 10 days, from 20th March till 29th March. An e-mail was sent to the population of 411 people who were related to Valmet Transportation in daily operations and contained a web link to the platform. The web link had a constraint of one answer per computer.

1.5 Theoretical framework of the study

As it was briefly mentioned above, then the theory was selected according to the relevance to this case. The frame work of the theory can be seen on Figure 1. These theories support the instructional design process and creation of logistics operations manual.

Figure 1. Research framework

2 Introduction of the thesis client

2.1 Valmet Corporation as a company

Valmet Corporation is a leading global developer and supplier of services and technologies for process industries. Valmet Corporation, with its operations in around 30 countries, employed about 10,500 professionals globally in its 100 sites. In 2014, Valmet Corporation's net sales were € 2.47 billion, where 40% of the net sales came from services and 39% from pulp and energy businesses. After demerger from Metso Group in December 2013, the corporation has three business lines: Services, Pulp and Energy, and Paper. *Figure 2* represents the global allocation of Valmet Corporation's sales offices, service centres, technology centres and production units, and *Figure 3* the allocation of personnel in these sites by area.(Valmet webpages 2015; Valmet Corporation 2015)

Figure 2. Global allocation of Valmet Corporation's sites (Valmet Corporation, 2015)

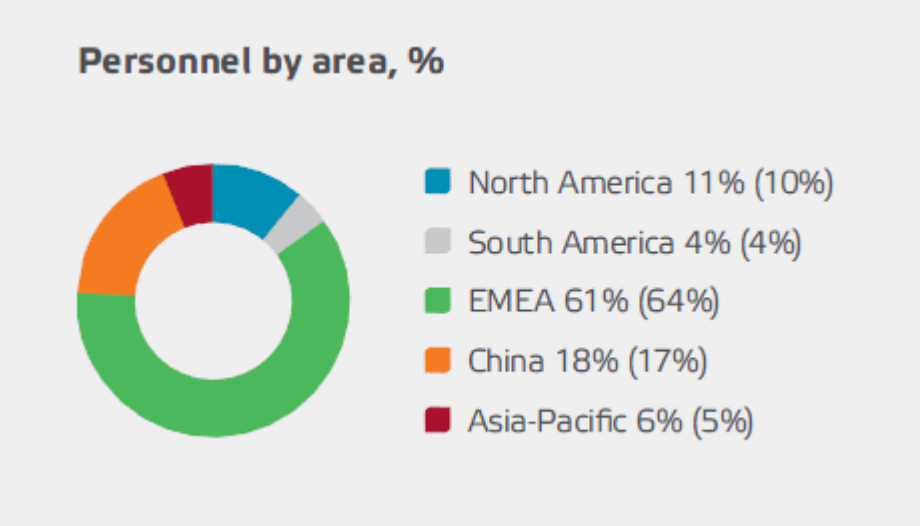

Figure 3. Personnel global allocation by percentage (Valmet Corporation, 2015)

2.2 Valmet Transportation

Valmet has around 8500 active suppliers in over 50 countries worldwide, but more than 50% of the supplier spend is done in Finland and Sweden. In 2012, the transportation spend on transportation exceeded € 100 million.(Valmet Corporation 2015; Valmet Intranet 2015). The Corporation is continuously seeking for cost optimisation and operations improvement opportunities, both financially and environmentally.

Valmet is putting great emphasize on developing sustainable supply chain by integrating new proactive tools and processes into the procurement practices. One of those new processes is also procurement personnel training – increasing the awareness and competences of sustainable procurement practices.(Valmet Corporation 2015)

Besides improving environmental figures, it is understood that Transportation and forwarding are part of supply chain management and play a significant role in the total logistics chain. Main transportation efficiency indicators at Valmet are on-time delivery, service quality, operational and process costs in addition to the actual transportation of goods. Indicators compliance with set targets are monitored by Valmet Transportation Team.

High-level logistics related decisions, transportation, and forwarding operations are controlled by Valmet Transportation Team which consists of

- Head of Logistics,
- 3 Global Category Managers,
- Valmet IT-solution Application Manager,
- Participants from the business lines and regional areas.

In addition to continuous performance evaluation, another VaTT's task is to assist and coach operational workers and low to mid-level managers on daily logistics related issues. Most of the assistance is done via telephone or e-mail, but in some cases a member of the VaTT is required to solve issues on-site.

3 Theoretical basis

3.1 Human Resources: New Employee Training

Hollinshead and Leat (1995) view human resources management (HRM) "as a distinct and innovative approach towards managing the employment relationship." In present days it is one of the fundamental parts organisations, dealing mainly with recruitment, and employees' training and development. According to Kitchen and Daly (2002), Porter (1985) states that "human resources management affects competitive advantage ... and in some industries it holds the key to competitive advantage." In this study only employee orientation in HRM is considered due to the scope of the research.

Even though Myers, Griffith, and Daugherty (2004) found in their research about "Maximizing human capital equation in logistics", that education and previous experience are not important when defining employee performance, then according to Kitchen and Daly (2002), Drucker (1993) states that "the knowledge worker is the greatest asset." It is supported by Grant (1991) who perceives knowledge worker as a primary stakeholder and states that management is challenged to implement methods which would enable employees to integrate their knowledge into productive activities. (Kitchen & Daly 2002)

Evolution of knowledge economy has created an immediate need for companies to continuously update employees' skillset according to the opportunities in the field (Meister 1998). Employees are viewed as critical factors in organisation's strategic success, hence it is important to get the new employee on the job and productive as soon as possible by minimizing possible defects occurrence in future and having a standardised orientation program in the very beginning of the employment (Dunn & Jasinski 2009).

Successful orientation program helps an employee to transition into new working environment, take responsibility, be independent and in the end of the program the new hire will have the understanding what is expected from him/her and what to expect from others (Dunn and Jasinski 2009; Brown 2007). Besides increased retention, Brown (2007) has listed positive effects that a thought-out orientation would have. It:

1. reduces start-up costs,
2. reduces employee anxiety,
3. reduces employee turnover,
4. saves time for supervisors and co-workers,
5. develops realistic job expectations for a new hire.

3.2 Logistics and Supply Chain Management education

According to Wu (2007), there is a rapidly growing diverse demand for logistics and supply chain professionals, whilst the definition of these activities are subject to change. The Chartered Institute of Logistics and Transport (2015) definition for logistics is

> *… the time-related positioning of resource. It is also described as the "five rights". Essentially, it is the process of ensuring that goods or service is in the right place, at the right time, in the right quantity, at the right quality, at the right price.*

According to Wu (2007) another definition for logistics by Lambert and Cooper (2000) is

> *… logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods,*

> *services, and related information from the point-of-origin to the point-of-consumption in order to meet customers' requirements.*

In addition to the definition of logistics, Arjan J. van Weele (2010, 18) defines supply chain management as

> *The management of all activities, information, knowledge and financial resources associated with the flow and transformation of goods and services up from the raw materials suppliers, component suppliers and other suppliers in such a way that the expectations of the end users of the company are met or surpassed.*

Even though each of the authors above have their own concise definition, the truth is that that in business life these definitions are often used interchangeably, hence as long as one understands that both of those terms refer to a comprehensive set of activities expressing the movement and storage of product and information, the terminology is not an issue (Wu 2007).

It was not before 1970 that logistics as a formal area of study started to become popular in colleges and universities. It was mainly caused by the companies and government institutions recognition for the need to include logistics in the functional management structure of the organisations, and increasing need for logistics professionals in the field. (Lancioni, Forman, & Smith 2001; Rushton, Oxley, & Croucher 2000; Wu 2007)
According to Myers, Griffith, and Daugherty (2004), Sheffi and Klaus (1997) identified the causes for increased need for logistics professionals as following: globalization of commerce, recognition of true costs of inventory, customers' increasing expectations for better quality, new emphasis on environmental issues, and corporate realignment for mergers and acquisitions.

In the past, the field of logistics has encountered a great difficulty to be acknowledged by business schools as a true discipline (Lancioni et al. 2001). Nevertheless, due the developments in the past decades, and yearly increasing industry demand for logistics/supply chain graduates have made logistics and supply chain management a popular academic area around the world, inducing the academic institutions to establish formal, continuously upgraded graduate and undergraduate degrees (Lancioni et al. 2001; Wu 2007). Thus, according to Wu (2007), Russell (1994) recommends to determine the content, from course to degree level, according to the opportunities offered in the marketplace.

In his study (2007), Wu notes that there are varied skills and education requirements for logistics/supply chain professionals in different regions. At large, logistics management skills are the most vital in all regions, followed by, with differences between regions, other skills, finance, information technology, and transportation and operations management skills.
Importance of information technology cannot be overemphasised as it has become an integral part of efficient logistics and smooth supply chain management. Therefore sound knowledge of IT is necessary for a logistics graduate to meet his or hers future challenges in the field. (Wu 2007)

In contrast to Wu (2007), Myers, Griffith, and Lusch (2004) found in their research that neither job experience nor education level were directly related to employee performance, but job skills such as decision-making, problem-solving, time management and social skills influenced employee performance and worth to the company. However, it was later discussed that the reason for poor evaluation for education and experience in the field might be that above mentioned requisite skills are more important or that they represent minimum or threshold level requirements. (Myers et al. 2004)

3.3 Change Management and Internal Communication

John Kotter (2011) has defined **change management** as

> *… a set of basic tools or structures intended to keep any change effort under control. The goal is often to minimize the distractions and impacts of the change.*

Burnes (2009) supports its rudimentary nature by stating that

> *… change management is not a distinct discipline with rigid and clearly defined boundaries. Rather, the theory and practice of change management draw on a number of social science disciplines and traditions.*

Increasing scarcity of resources puts heavy burden on management to develop efficiency, improve usage of available resources, and reduce organisations expenditure (Garnett & Kouzmin 2000, 62; Proctor & Doukakis 2003). In order to maintain in the global competition, the challenge for the companies is not

about planning the change, but learning to live with it, anticipate it and capitalise on opportunities (Kitchen & Daly 2002).

According to Torrington, Hall and Taylor (2002), there are different forms of changes which, in one way or another adjust organisation's functions towards excellence. Since the organisation's performance depends on the actions of its employees, the organisation can change only when its members' behaviour changes (Elving 2005). Hence, communication about the change and information to these employees is very important. Employees and the way they are involved in the change process is often described as a decisive factor whether the expected organisational change is achieved or not (Kitchen & Daly 2002). In addition, effective change is possible when there is low levels of resistance to change, or high level of willingness to implement these changes (Elving 2005).

According to Kitchen and Daly (2002), Matheson and Matheson (1998) point out in their research the factors that could hold back the effective implementation of change management programmes, which, among many others, include internal focus, lack of credibility, and secrecy. These factors can easily be avoided, by using organisations formal and informal channels for information dissemination (Kitchen and Daly 2002).

Internal communication, also known as employee communication, organisation communication, and corporate or business communication, is an important element in organisation, which influences how well the organisation performs. According to Spiker and Lesser (1995) it is used to inform, explain or prepare employees for change and prepare them for possible positive and negative effects. (Kitchen & Daly 2002; Elving 2005)

According to Kitchen and Daly (2002), De Greene (1982) presents in his work main information transmission problems within organisations which include: one-sided communication processes, concealed information, transmission of false facts, internal gossip, and purposeful distortion. In addition to that, received information might be misunderstood or not listened by the receiver.

In order to defeat above mentioned problems and organisational malaise, Proctor and Doukakis (2003) has proposed three action lines:

1. Wherever possible, by using IT short-cuts pass and make information directly available for front-line managers and operational staff.
2. Provide comprehensive training about management skills for middle management.
3. Introduce an employee development system with focus on communication issues and which would have a synergistic effect together with previous points.

Management of knowledge, internal communication and employees are all recognised in contemporary business administration literature as essential parts for ensuring organisations survival, growth and success (Kitchen & Daly 2002; Hargie & Tourish 1993). Therefore it is very important for management to handle and lead these factors in daily business life.

In order to ensure efficient information exchange, the information has to be in time, understandable, and cannot contain any errors. It should be explained to employees, why the decisions are made and what is their purpose as well as information exchange has to be enabled in both directions (Proctor and Doukakis 2003).

Chen (2008) states that nowadays the learning and teaching methodology has changed, as the learning usually takes place virtually, where the learner interacts with courseware and other tools, eliminating the tutor from the process. Reiser (2001) adds that interest in using Internet for distance learning is trending. This means that great effort has to be put on creating clear and unambiguous materials for employees, which could be accessed from distance.

3.4 Instructional Design

3.4.1 History

World War II is considered as an initiator for instructional design (ID) procedures development. During the war, large amount of psychologists and educators were involved in developing training material for military services (Reiser 2001). After WWII, the systematic approach continued to develop, finding its roots mainly in military and business world. (Chen 2008)

Reiser (2001) designates Skinner's (1954; 1960) ideas to be revolutionary, as he defined the nature of instructional material. This kind of materials should present instruction in small steps, require transparent answers to frequent questions, provide immediate feedback, and allow self-pacing. Skinner, together with Lumsdaine and Glaser (1960) were the first who described an empirical approach to surmount educational problems. In addition, Scriven (1967) emphasised in the need to try out instructional materials with its users before formatting the instructions into final form. This methodology is nowadays called formative evaluation. (Reiser 2001)

In the 1970s the number of instructional design models started to increase rapidly as business and industry started to see value in ID to improve the quality of training. During the decade, more than 40 different ID models were identified. (Reiser 2001)

In the 1980s, the instructional design continued to develop and spread internationally, mostly in business, military and industry. The production of computer-based instructions started to develop with the advent and introduction of first microcomputers (Dick 1987; Reiser 2001). The designers put emphasis mostly on front-end analysis, on-the-job performance, business results, and non-instructional solutions to performance problems. (Reiser 2001)

The electronic performance support system began to develop at even faster rate in the 1990s. These systems were meant to support employees in certain job tasks, at the time the help is needed, and in most helpful form. Furthermore, constructivism became popular in the 90s. It is defined as a set of similar views of learning and instruction, which concentrates on solving complex and realistic problems in collaboration by analysing the problem from different perspectives, whilst taking ownership of the learning and clarifying designer's role in the knowledge construction process (Reiser 2001).

Nowadays, rapid prototyping is considered as a new trend in instructional design. Originally used in software design, the rapid prototyping has been implemented in ID. When using rapid prototyping method, the prototype is developed quickly and is expected to go through various try-outs and revisions, before the final product is produced. (Reiser 2001)

Throughout the last 5 decades, there are many names for instructional design, which include: systems approach, instructional systems design, instructional development, and instructional design (Reiser 2001). In this work only the term instructional design is used.

3.4.2 Methodology

Instructional design as a discipline is considered to be part of artificial sciences (Tripp & Bichelmeyer 1990), which analyses the relationship between human learning and education design(Chen 2008). Chen (2008) defines ID as "the system of planning events to facilitate learning." It consists of many interrelated phases forming different ID models, which help the designers to visualize the problem and divide it into smaller, manageable units (Ryder 2014). According to Chen (2008), there are more than 100 different ID models, out of which, majority is based on a generic ADDIE model. Even though Bichelmeyer (2005) admits in her presentation that ADDIE model is the foundation element of ID, then there are still some people who have the understanding that ID and ADDIE model are synonymous.

The ADDIE model consists of five interrelated instructional design phases, as represented below in Figure 4.

Figure 4. The ADDIE model

In the Analysis phase, the designer needs to create the foundation for the whole design process. One needs to clarify the goals, objectives, and analyse

the learner and needs for instructions (e.g. Gardner 2011a; Civil Service Training Centre 2013).

The Design phase clarifies and creates the assessment method for learners, determines the medium of instructions and creates instructional strategy (e.g. Gardner 2011b; Civil Service Training Centre 2013).

The Development stage of the ID is very straight forward and output oriented. In this phase the designer is expected to create a sample instruction, collaborate with the client and conduct a user testing (e.g. Gardner 2011c; Civil Service Training Centre 2013).

In the Implementation phase the instructions will be made available for client and the users from whom the feedback is collected (e.g. Gardner 2011d; Civil Service Training Centre 2013).

Last, Evaluation phase is for follow-up. The designer will use previously gathered feedback and additional assessment to measure the level of objectives achievement. In additionally, personal feedback from the designer, such as personal gains and recommendations for future development, is expected (e.g. Gardner 2011e; Civil Service Training Centre 2013).

In recent years, the dissatisfaction with ADDIE model has started to increase progressively, as researchers find it costly, outdated, does not take advantage of digital technology and it does not describe the actual work of instructional designers (Tripp & Bichelmeyer 1990; Bichelmeyer 2005; Chen 2008). Additionally, according to Bichelmeyer (2005), Molenda (2003) did not find an original reference to ADDIE model, hence he formed a theory that ADDIE is not a model at all. On this basis and taking into account that ADDIE does not represent what instructional designers do, Bichelmeyer (2005) concluded that ADDIE is a conceptual framework.

Design process is endless, without evidently correct methodology and cannot be represented statically. There will always be a need for better design methodologies while maintaining and increasing the effectiveness of current models.

As it is rarely possible to identify all possible solutions, the designer is expected to make decisions without complete information(Tripp and Bichelmeyer 1990). Often it means implementing assumptions and starting solving one problem at a time, till expected result is achieved.

3.4.3 Rapid Prototyping Model

According to Tripp and Bichelmeyer (1990), “the methodology of rapid prototyping has always been with us, even if the models of the design did not acknowledge.” As it was mentioned above, ADDIE model does not take advantage of the digital technologies that enable the designer to use less-linear approaches for instructional design. On the contrary, rapid prototyping model is found to be a viable model in the context of computer-based instruction. It is also proved to be in line with the evidence of empirical research on how designers work. (Tripp and Bichelmeyer 1990)

Rapid prototyping model originates from software design, where it is used for rapid construction and modification of software. Similarly, instructional designers are using it for rapid instructional material creation with the immediate feedback from end-users. According to Tripp and Bichelmeyer (1990), Lantz (1986) proves that rapid prototyping

- satisfies users,
- reduces development costs,
- decreases communication issues,
- reduces operational costs,
- reduces project period,
- produces correct product for designated task.

Additionally, it enables greater flexibility for instructional designer to find solutions for complex problems as research and development are conducted in parallel. (Tripp and Bichelmeyer 1990)

Disadvantages of the rapid prototyping model are

- there is a great chance to encourage informal design methods which may cause additional problems. E.g. the free form of design activities might lead to design-by-repair philosophy, which represents a lack of discipline. Additional informal design methods would be leaving the analysis of instructional design activities aside, using rapid prototyping on problems which are inappropriate for it or by adding too many bells and whistles the design gets out of control.
- each developed system will be unique and would not have general applicability. (Tripp and Bichelmeyer 1990)

Figure 5 outlines the main occurrences in rapid prototyping model. Horizontally overlapping boxes represent simultaneously happening processes, which means that content and needs analysis depends on the knowledge that is gain during the actual building and prototyping of the instructional material.

The utilisation phase is the most crucial part of the design process where new information is gained through problem solving, but most importantly new problems are discovered. In case of new problems the designer modifies the tentative objectives or creates new ones. With new objectives the prototyping process starts again. Lantz (1986) states that

> *... research and development are conducted as parallel processes that create prototypes, which are then tested and which may or may not evolve into a final product.*

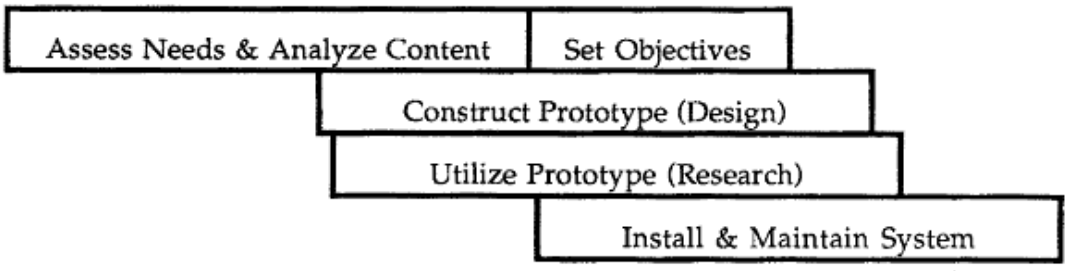

Figure 5. The Rapid Prototyping ID Model. (Tripp and Bichelmeyer 1990)

Considering all the information above about ID and the nature of the project-based study, the the rapid prototyping model was found to be the most appropriate ID model for Valmet's case. More precisely, taking the short time period and required content, rapid protyping helps to save a lot of time as smaller questions can be solved almost immediately.

4 Instructional Design Process

Rapid prototyping model was chosen for manual creation in order to meet the time and budget constraints set by the project. Additionally, when ADDIE and rapid prototyping models were compared then rapid prototyping was found to be more suitable due to the set constraints, its flexibility and accordance to planned actions. Factors affecting the rapid prototyping model choice were professionals statement (e.g. Bichelmeyer 2005) that it is proved to be in line on how instructional designers actually work, and the advantages of the model listed by Lantz (1986).

4.1 Needs assessment and content analyse

The initial invitation for collaboration (Loikkanen 2015), starting meeting with Mr. Kurkinen (2015) and "Questionnaire for VaTT" (See Appendix 1. Questionnaire for Valmet Transportation T) became the mainstay of the needs assessment in this project-based study. VaTT's previous empirical evidence had created the need for logistics operations manual to reduce transportation costs, harmonise corporate-wide professional knowledge, ease on-the-job training (OJT) and increase employee innovation in logistics solutions.

It was acknowledged in the beginning, that the creation of the manual will be an ongoing operation. Therefore limitations on essential content (see Appendix 2. Essential logistics operations manual's table of content) were created together with Mr. Kurkinen at the starting meeting (2015) with additional specifications added by Questionnaire to VaTT (see Appendix 1. Questionnaire for Valmet Transportation T). Survey for employees (see Appendix 3. Questionnaire about current training and information usage at Valmet Transportation)

was planned and created to get an employee point of view to the matters under question.

After setting limitations, understanding the requirements and defining the framework topics (see Figure 1. *Research framework*), a focussed in-depth study was carried out in the fields of Instructional Design, Human Resource Management: New Employee Training, Change Management and Internal Communication, and Logistics and Supply Chain Management Education. Theoretical and the Logistics Operations Manual-specific literature review was carried out simultaneously.

4.2 Setting objectives

After discussions with VaTT, interviews with Ms. Laitiainen, Ms. Moilanen and Ms. Väisänen (2015) and in parallel with literature review, it was decided that the manual will be constructed using rapid prototyping model and will reflect most essential logistics tasks, taking into account Valmet Transportation's daily standard cargo logistics operations.

In order to optimize time and the first trial of the manual, a survey was conducted among Valmet employees. An in-depth analysis can be found in Appendix 4. Survey analysis.

4.3 Prototype construction and utilisation

The first prototype was developed by following the compliance to originally planned content with VaTT. The prototyping involved using empirical knowledge of VaTT and Mr. Ilison, utilising available Valmet sources, studying Valmet's partners' web pages and logistics related literature.

Next, the prototype was sent to VaTT for content overview, who evaluated the compliance with originally planned content and made recommendations for changes in content when deficiencies were detected. After the deficiencies were eliminated and the prototype re-edited, it was presented to VaTT again.

This process continued till satisfactory manual, which will support new employee's daily operation, was achieved.

Due to the fact that the industry is changing continuously, the manual will be developed further to include state-of-the-art knowledge and information and make it available for new and existing employees. Additionally, as the essential manual was created in compliance with the originally planned content with VaTT, then further development will include employees' suggestions for content additions drawn from the survey in Appendix 4. Survey analysis.

4.4 Formative evaluation

The prototyping and instructional design process is going according to the planned schedule and the essential logistics operations manual will be available by the end of May 2015. It is difficult to speculate the total amount of necessary utilisation and construction phases, but as most of the content was already available in the first prototype, then now additional research has to be conducted on the necessary content and its improvement.

The first prototype of the manual brought out the need to reconsider the content of the manual as Tripp and Bichelmeyer warned about possible exaggeration faults in the design process. All available information cannot be presented as it might end up confusing the users. Therefore it is necessary to exclude available special cases.

5 Conclusions and further research

The main aim of this project-based study was to compile a logistics operations manual for Valmet Transportation operational staff, which would help an employee to choose a correct transportation method. The manual is expected to be used mostly by operational staff, but also by low- and middle-level management.

The manual was developed using instructional design's rapid prototyping model, supported by theory from the fields of human resources management, change management and internal communication, logistics and supply chain education and instructional design. The used model was very appropriate for this project, as it allowed to operate within the set constraints and offered flexibility for the designer. Even though there are many advantages when using rapid prototyping model, the human factor can set unexpected limitations. Further on, in top management level the response time to information queries can be long due to staff's overload and task prioritising. Hence, when using rapid prototyping, it is recommended to continuously do project status updates to the client in order to schedule necessary actions ahead of time.

The tasks shown on **Error! Reference source not found.** are appropriate, easily implementable and happen in the shown order. It was difficult to differentiate each task's boundaries as many thing happen simultaneously and therefore it proves the flexibility of the model. Additionally, the flexibility allowed to seamlessly shift from one task to another when an unexpected disruption occurred.

The needs assessment and content analyse was based on VaTT's empirical evidence, included supplementary questionnaires among Valmet Transportation employees, and defined the framework topics, and time and budget limitations. The objectives setting phase is almost an integral part of the first phase, where three Valmet employees were asked to point out factors that have restrictive effect on their daily operations. Additionally, a survey was conducted among personnel related to Valmet Transportation in their daily tasks. Prototypes were created and developed using VaTT's and Mr. Ilison's empirical knowledge, Valmet sources and studying Valmet's partners' web pages and logistics literature. Then the prototype was utilised among VaTT and Valmet Transportation employees and feedback about the content was collected. The prototypes were recreated, reutilised and re-edited until an agreed essential and satisfactory manual content was achieved. The full integration, further development and maintenance of the manual will be continued by VaTT.

This study can be used as an example in future for instructional design in logistics. It shows which topics were considered when creating a manual for logistics operations staff.

5.1 Research Critique

The project had a strict time limitation from the beginning. Therefore time was the most important factor when choosing suitable methodology for this work as the quality of the outcome cannot be affected by this constraint.

Additional theory besides instructional design was selected to support this specific case and its practical implementation. For future references the content and nature of this study has to be reviewed as it might not be 1:1 usable in other context.

The employee survey did not have the desired 5% level of error at 95% confidence level. Instead, 8% error level was achieved. Unfortunately in this case complete conclusions about the survey population cannot be drawn. Nevertheless, VaTT can use the responses as suggestions for further development.

The project-based study differs from regular theoretical research, meaning that only a final product was developed without additional discoveries in theory. Therefore a conclusion can be made that the study and outcome of it is only practical to the thesis client, Valmet Technologies, Inc.

5.2 Suggestions for Future

Suggestions for the future improvements in Valmet Technologies, Inc. are the following:

- **Implement mentorship for new employees** - Brown (2007) suggests to have a mentor available for new employee from the first day as not only can the mentor help the new hire with work specific orientation, but also introduce him or her to colleagues and help to settled down. Additionally, in Valmet this is also supported by the respondents of the survey.

- **Centralised and improved information platform** – all available sources should be centralised to one easily accessible platform, where the content will be easily searchable and renewable and will be compatible with mobile devices. It would be recommended to consider the manual to be changed into similar format as IATA virtual manual, where the information is punctual and easily searchable.
- **Knowledge management specialist**– it would be recommended to assign or hire a person to deal with knowledge management and the manual renewing. Reiser (2001) refers to Rossett (1999) in his article, that "knowledge management involves identifying, documenting, and disseminating explicit and tacit knowledge within an organisation in order to improve the performance of that organisation. This should eliminate the possibility that useful knowledge and expertise will be residing within a small group.
- **Future improvements to the manual** – the additional topics suggestions proposed by the respondents of the survey are appropriate and should be considered to be added to the manual.
- **"Listening employees"** – it is highly recommended to give operational level employees an opportunity to express themselves, either in the form of discussion or feedback (e.g. "Valmet Café). The vertical information flow in a corporation has to be effective in both directions.

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Appendices

Appendix 1. Questionnaire for Valmet Transportation Team

1. What are the current problems why the manual is needed?
2. What is the objective/goal of the manual? Which KPIs it should improve?
3. Who is going to be the audience/users of the logistics operations manual?
4. What areas do you find are necessary to be covered in the manual?
5. How is the manual going to be updated? Will someone be put in charge of the updating? Who?
6. When changes are made, how will the changes reach the sites?
7. Will the changes be printed on a hard copy and mailed? Will they be e-mailed? Will they be put into Valmet's intranet?
8. How will one know that changes have been made to existing manuals? How will one know if changes have been implemented?
9. Will manual inspection and implementation be a part of a quality-control audit?
10. Will an acknowledgment of receipt be e-mailed or faxed from the sites confirming that changes were received, entered into the site's manual and a signed acknowledgement that they will be implemented by a certain date?

Appendix 2. Essential logistics operations manual's table of contents

Abbreviations
1 Introduction of Valmet and its operations
1.1 Valmet Corporation
1.2 Transportation in Valmet
1.2.1 Structure of transportation teams
2 Packaging
2.1 Ways of packaging in Valmet
2.2 Transport units
2.2.1 The MUSTs for fast shipping
2.3 Labelling
3 Transportation
3.1 Nominations
3.2 Road
3.2.1 Transportation networks
3.2.2 Shipping methods
3.2.3 Chargeable weight
3.2.4 Price structure
3.2.5 Documentation
3.3 Ocean
3.3.1 Shipping process
3.3.2 Containers
3.3.3 Chargeable weight
3.3.4 Price structure
3.3.5 Documentation
3.4 Air
3.4.1 Transportation networks
3.4.2 Unit Load Devices
3.4.3 Chargeable weight
3.4.4 Price structure
3.5 Courier
3.5.1 Transportation network
3.5.2 Shipping methods
3.5.3 Partner specific limits
3.5.4 Chargeable weight
3.5.5 Price structure
3.5.6 Documentation
4 Transportation legislation and administration
4.1 Incoterms
4.2 How to make a booking
4.3 Insurance
4.4 Transportation contract
References
Appendices

Appendix 3. Questionnaire about current training and information usage at Valmet Transportation

Current logistics background of the employee

1. What is your gender?
    a. Female
    b. Male

2. What is your age?
    a. 19 and Under
    b. 20 to 29
    c. 30 to 39
    d. 40 to 49
    e. 50 to 59
    f. 60 to 64
    g. 65 and Older

3. What is the highest level of education you have completed?
    a. Other
    b. Basic Education
    c. High school diploma
    d. Non-degree program
    e. Associate's degree / College degree
    f. Technical diploma
    g. Bachelor's degree
    h. Master's degree
    i. Doctorate degree

4. Do you have a degree in the field of logistics, transportation, procurement or supply chain management?
    a. Yes
    b. No

5. In which of the following departments do you work?
    a. Purchasing
    b. Logistics and Transportation
    c. Other (please specify)

6. Where is your main office located?
    a. Brasilia
    b. Canada
    c. Chile
    d. China
    e. Denmark
    f. Finland
    g. France
    h. Germany
    i. India
    j. Indonesia
    k. Italy
    l. Japan
    m. Korea
    n. Portugal
    o. Spain
    p. Sweden
    q. Thailand
    r. United States
    s. Other (Please specify)

7. What is your current employment level?
    a. Operational worker
    b. Low-level manager
    c. Mid-manager
    d. Top management

8. How many service years do you have with Valmet/Metso corporation?
    a. Less than 1
    b. 1-2

c. 3-4
d. 5-10
e. 11-20
f. 21 and more

9. Before you started to work in Valmet/Metso, did you have any kind of background in the field of logistics?
    a. Yes
    b. No

10. If Yes, how many years?
    Numerical input

11. How many years of experience in total do you have in the field of logistics (incl. procurement, warehousing etc.)?
    Numerical input

Information usage habits at work

12. Please pick 3 main information sources you use to solve easier field related issues
    a. Web search
    b. Valmet Homepage
    c. MS Outlook
    d. Flow
    e. Lotus Notes
    f. Direct Supervisor
    g. Valmet Global Transportation Team
    h. Other (please specify)

13. Please pick 3 main information sources you use to solve complicated field related issues´
    a. Web search

b. Valmet Homepage
c. MS Outlook
d. Flow
e. Lotus Notes
f. Direct Supervisor
g. Valmet Global Transportation Team
h. Other (please specify)

14. Is it easy to find information from current Valmet sources (e.g. Lotus Notes, Flow)?
    a. Yes
    b. No

15. What makes the information usage difficult?
    a. I am not sure is it up-to-date
    b. Information is dispersed between many platforms
    c. Information changes rapidly
    d. I am not notified about the changes in the information
    e. It is not difficult to find information
    f. Other (please specify)

16. Which communication platform do you use daily to support your working tasks?
    a. MS Outlook
    b. LYNC
    c. Social messengers (e.g. Whatsapp, Facebook)
    d. Other (please specify)

17. If you have any suggestions how to improve the communication methods and current information flow, please write below.
    Text input

Employee orientation experience

18. When you started to work at Valmet/Metso, your orientation was mainly
    a. “Sitting next to Nellie” training, On-the-job training
    b. Independent, On-the-job training
    c. Orientation period before actual training
    d. Other (please specify)

19. How helpful was the training you received when you started your job?
    a. Extremely helpful
    b. Quite helpful
    c. Moderately helpful
    d. Slightly helpful
    e. Not at all helpful

20. Is there any field specific literature/support material available in the office?
    a. Yes
    b. No

21. If Yes, do you use this material?
    a. Yes
    b. No

22. What suggestions do you have for improving the new employee orientation?
    Text input

Opinions about the handbook

23. The topics that are planned to be covered in the handbook are:
    Valmet Transportation and its structure
    Packaging and transport units (technical data)
    Transportation (land/sea/air/courier)

How to choose the right transportation mode/method
volume calculation formulas, pricing
Nominations
Incoterms
How to make a booking? What to keep in mind?
Insurance
Main points of transportation contract
Do you find this information is relevant to a new employee for independent working?

a. Yes
b. No

24. If you answered No to previous question, please specify.
Text input

25. Are there any topics that should be included? Please specify.
Text input

26. Do you find it necessary to have this kind of handbook available for new and existing employees?

a. Yes
b. No

27. If you answered No to previous question, please specify.
Text input

28. The handbook should be in the form of

a. Book
b. PDF
c. Book & PDF
d. Other (please specify)

Closing

29. If you have any additional relevant information to share, please write about it below.

    Text input

Appendix 4. Survey analysis

Appendix 5. Logistics Operations Manual